Navigation & the Environment: Recommendations for a Sustainable Upper Mississippi River Navigation System

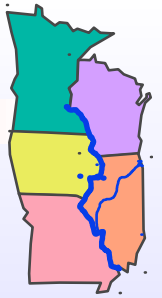
Implementation of NESP

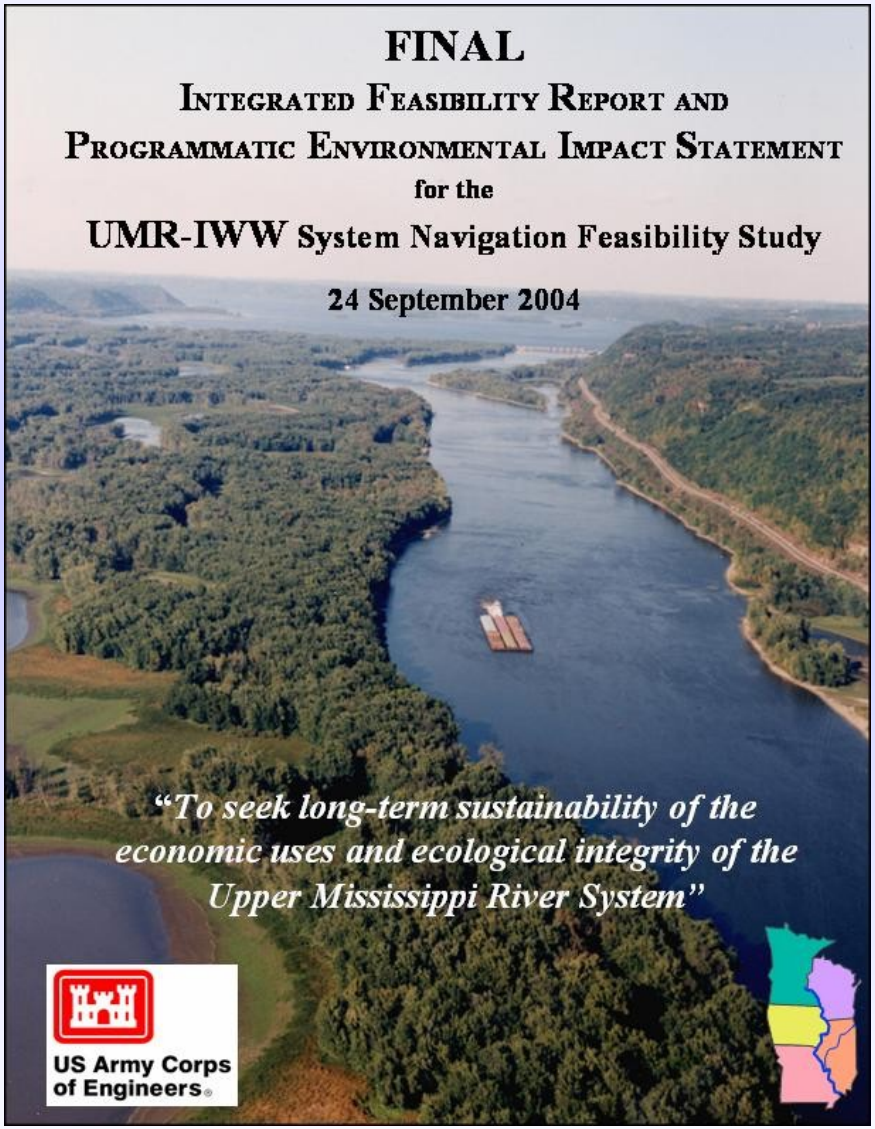
River Resources Forum

Dec 2007

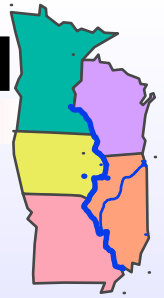
Chuck Spitzack and Ken Barr
Corps of Engineers

INTEGRATED FEASIBILITY REPORT AND PEIS



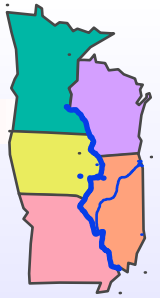

FINAL
Integrated Feasibility Report and
Programmatic Environmental Impact Statement
for the
UMR-IWW System Navigation Feasibility Study
24 September 2004
"To seek long-term sustainability of the economic uses and ecological integrity of the Upper Mississippi River System"
US Army Corps of Engineers

RECOMMENDED DUAL PURPOSE PLAN



- **$2.4 Billion Navigation Efficiency Framework**
- **$5.3 Billion Ecosystem Restoration Framework**
- **Adaptive Implementation – First Increment**
  - ✓ **Navigation Efficiency = $1.88 B**
  - ✓ **Ecosystem Restoration = $1.46 B**
  - ✓ **Decision Checkpoints at 3, 7, and 15 yrs.**

Navigation Implementation

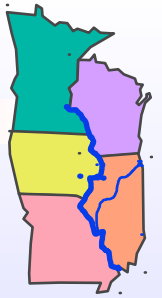


$1.88 billion in First Increment

- Mooring Facilities @ Locks 12, 14, 18, 20, 22, 24 and LaGrange
- Switchboats @ Locks 20 through 25
- Adaptive Implementation of 1200’ chambers at Locks 20, 21, 22, 24, 25, LaGrange and Peoria
- Mitigation for Site Specific and System Effects
- Continued Study and Monitoring

New
Lock
NEW LOCKS

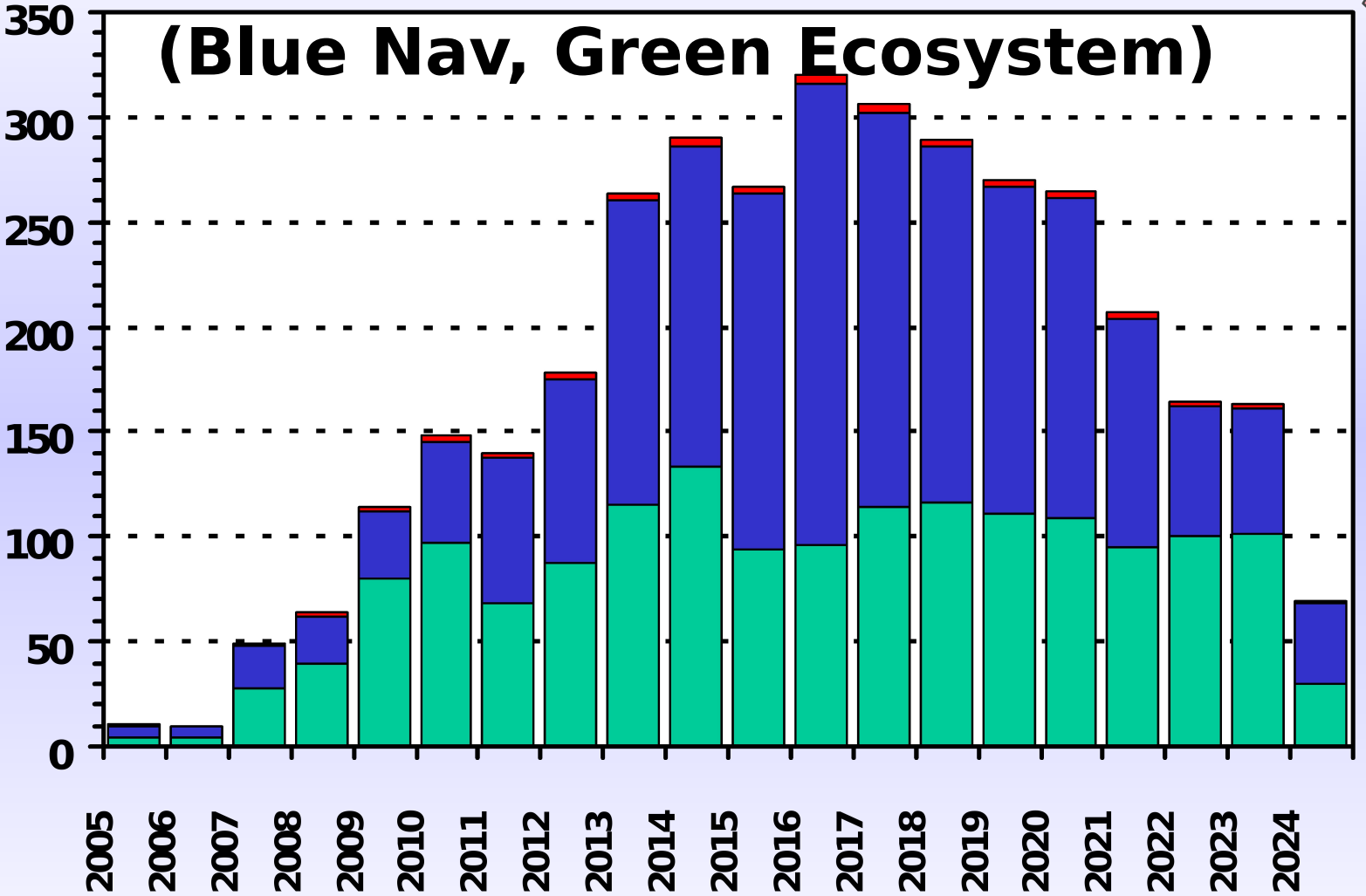
Ecosystem Restoration Implementation

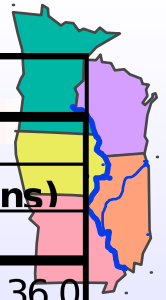


$1.46 billion in First Increment

- **Fish Passage @ Dams 4, 8, 22, and 26**
- **Changes in Water Level Control @ Dams 25 and 16**
- **Forest & Cultural Resources Management Plans**
- **Adaptive Implementation of 225 small projects of less than $25 million each**
  - **Island Building**
  - **Water Level Management**
  - **Backwater/Side Channel Restoration**
  - **Wing Dam/Dike Alterations**
  - **Island Shoreline Protection**
- **35,000 Acres of Floodplain Restoration**
- **Continued Study and Monitoring**

Nav Feasibility Study First Increment Plan

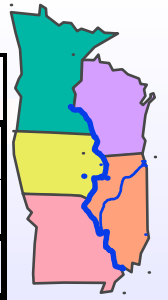




Total Ecosystem First Increment Plan (15 year)

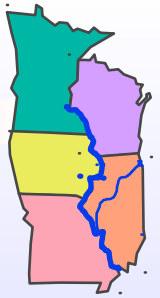
Ecosystem Measures	Number of Projects	Costs (2003 millions) Measure
Adaptive Management	-	$136.0
Cultural Stewardship	78	$13.0
Cultural Mitigation		$13.0
Forest Management	0	$37.6
Island Building	23	$150.9
Fish Passage	4	$209.0
Floodplain Restoration (Pools 1-13)	10	$18.0
Floodplain Restoration (Rest of UMR-IWW)	7	$140.0
Water Level Management - Pool	13	$61.7
Water Level Management - Backwater	5	$38.3
Backwater Restoration (Dredging)	33	$145.5
Side Channel Restoration	29	$80.8
Wing Dam/Dike Alteration	19	$28.5
Island Protection	33	$31.1
Shoreline Protection	40	$37.6
Topographic Diversity	9	$13.5
Dam Point Control	2	$25.3
Restoration Response Monitoring and Evaluation		$136.0
Total	227	$1,315.8
Real Estate		$146.0
Grand Total		$1,461.8

Upper Floodplain Reach - (Pools 1-13) First Increment Plan



Ecosystem Measures	Number of Projects	Project Costs (Millions) Measure
Adaptive Management	-	$34.0
Cultural Stewardship	52	$8.0
Cultural Mitigation		$3.3
Forest Management		$9.4
Island Building	8	$52.5
Fish Passage	2	$100.0
Floodplain Restoration (Pools 1-13)	10	$18.8
Floodplain Restoration (Rest of UMR-IWW)[a]	-	-
Water Level Management - Pool	6	$28.4
Water Level Management - Backwater	3	$19.1
Backwater Restoration (Dredging)	12	$52.9
Side Channel Restoration	4	$11.3
Wing Dam/Dike Alteration	2	$3.0
Island Protection	12	$11.3
Shoreline Protection	10	$9.4
Topographic Diversity	3	$4.5
Dam Point Control	-	-
Restoration Response Monitoring and Evaluation		$34.0
Total	72	$399.9

Authorization Issues of Interest



- 100% Fed Funds below Ordinary high water mark
- NGOs as Cost share partners
- Cooperative Agreement Act
- Ranking system and Advisory Committee

http://www.doi.gov/initiatives/AdaptiveManagement/index.html

Vision Statement

(Upper Mississippi River Summit 1996)

To seek long-term sustainability of the economic uses and ecological integrity of the Upper Mississippi River System

System Goal

(Science Panel, Navigation & Ecosystem Sustainability Program)

Conserve, restore, and maintain the ecological structure and function of the Upper Mississippi River System to achieve the vision for the Upper Mississippi River System

Second Tier Goals

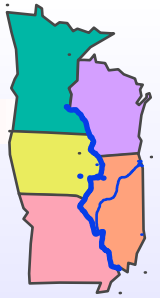
(Grumbine 1994; adopted by UMRCC 1995)

- **Maintain viable populations of all native species in situ**
- **Represent all native ecosystem types across their natural range o**
- **Restore and maintain evolutionary and ecological processes**
- **Integrate human uses and occupancy within these constraints**

UMRS Ecosystem Objectives

(Lubinski and Barko 2003, ENV Report 52)

43 Ecological objectives within 5 essential ecosystem characteristics: water quality, geomorphology, hydrology & hydraulics, habitat, and biota



BOX 3 – Elements of Ecosystems

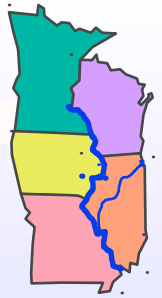
(adapted from Society for Ecological Restoration 2004)

Process **refers to rates of essential ecosystem functions, such as population growth, photosynthetic rate, decomposition rate, dispersal rate.** (e.g., effects of a 2-foot early-summer drawdown on production of annual moist-soil plants)

Function **defines the dynamic attributes of ecosystems, including density organisms, interactions among organisms, and interactions between organisms and their environment. (e.g., effects of changes in winter dissolved oxygen levels on density of overwintering white crappie)**

Structure **refers to the parts of the whole or the architecture of a community.** It includes the pattern of habitats, the frequency distribution of species-populations, and the sizes and life forms of the organisms that compose communities. (e.g., size-frequency distribution of largemouth bass in Pool 11)

Landscape Objectives



UMRS Landscape Objectives:

Objectives categorized into 7 landscape classes

- Forest
- Grass/Prairie
- Island

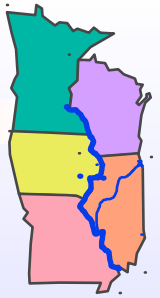
Terrestrial

- Wetland
- Backwater
- Side Channel
- Main Channel

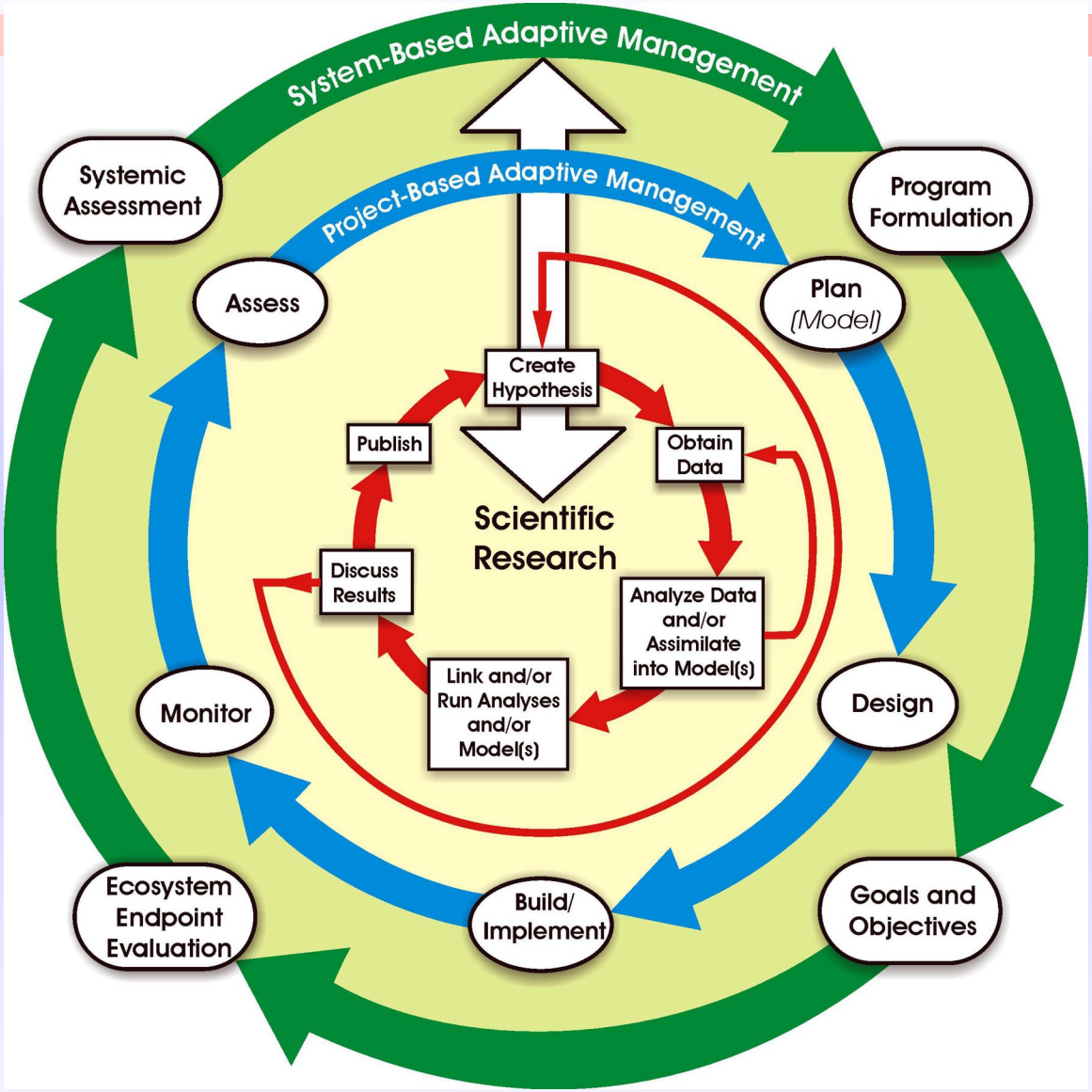
Transitional

Aquatic

Geomorphic Reach Workshops



- Preparation meeting
- January 9-10 SGO Workshop in Moline, IL
- Reach meetings Beginning in April (Pool 5?)


System-Based Adaptive Management
Project-Based Adaptive Management
Systemic Assessment
Program Formulation
Assess
Plan (Model)
Create Hypothesis
Publish
Obtain Data
Scientific Research
Discuss Results
Analyze Data and/or Assimilate into Model(s)
Link and/or Run Analyses and/or Model(s)
Monitor
Design
Ecosystem Endpoint Evaluation
Build/ Implement
Goals and Objectives

SA
AM
SF
SYSTEM
EE
GO
RIVER COUNCIL
RA
AM
R
FLOODPLAIN
F
REACH
EE
GO
RA
AM
RF
GEOMORPHIC
REACH
EE
GO
A
AM
P
PROJECT
M
D
B
DATA & MONITOR
PLAN & MODEL
DATA & MONITOR
PLAN & MODEL
DATA & MONITOR
PLAN & MODEL
NON-AM PROJECT
SCIENCE PANEL (adv
RIVER TEAMS + WORK
GROUPS
RIVER SUPPORT TE
ER PDTS
SYSTEM
Levels of Adaptive
gemen

Institutional Arrangements

National & Regional

MISSISSIPPI RIVER COMMISSION

FEDERAL PRINCIPALS

UMRBA (States)

UMRS System

NAVIGATION & ECONOMICS PANEL

RIVER COUNCIL

ENVIRONMENTAL + NAVIGATION

WORK GROUP (LTRM)

COM NETWORK

SCIENCE PANEL + REGIONAL TEAM

Reach

RIVER RESOURCES FORUM

WORK GROUPS

RIVER RESOURCES COOR TEAM

WORK GROUPS

IL RIVER WORK GROUP

RIVER RESOURCES ACTION TEAM

WORK GROUPS

Project

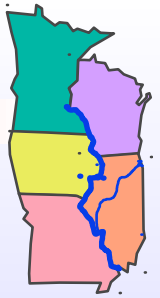
PROJECT DELIVERY TEAMS ... include partners and work within "management plans"

NOTES

Institutional arrangements are for collaboration and do not constitute an organizational hierarchy.

Communication among elements of institutional arrangements is encouraged.

Connecting lines are primary associations not lines of authority.

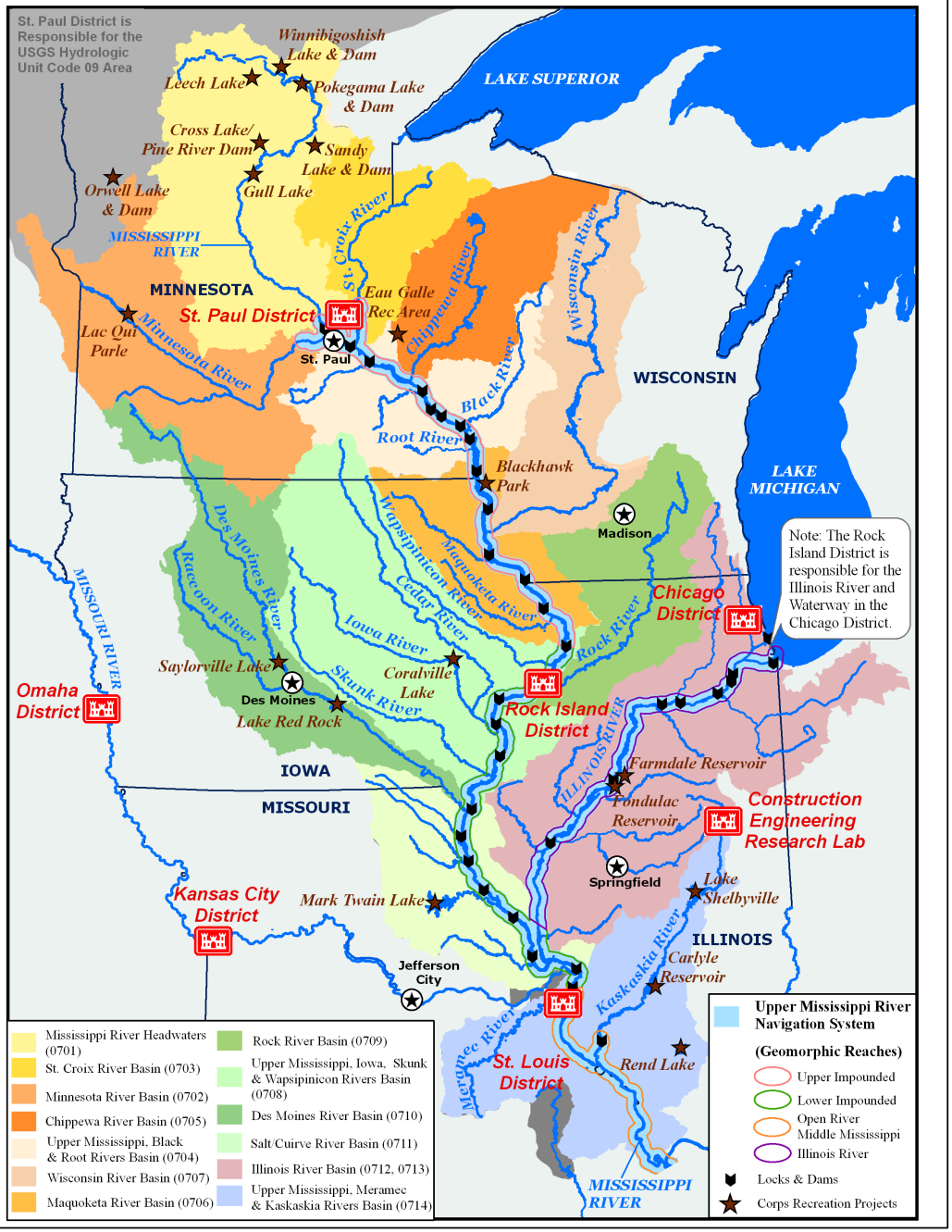


RIVER COUNCIL

- Verify satisfaction with draft provisions
  - USACE & USFWS (Oct 07)
  - Partners & stakeholders (Dec 07)
- Meet with MVD - collaboration framework (Jan)
- Submit to USFWS & USACE for approval (Feb)
- Confirm compatibility with guidance
- USFWS & USACE make joint request to States to approve, sign MOU, and assign representatives
- Stand up River Council (Nov 08)

The Upper Mississippi River Basin

(USGS Hydrologic Unit Code 07)



Dual Purpose Plan …

To seek long-term sustainability of the economic uses and ecological integrity of the Upper Mississippi River System